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The Effect of Comic Book's Story Character and Color on Farmers' Knowledge Gain About Small Sheep Farm Management in Kulur, District of Majalengka, West Java, Indonesia

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ABSTRACT

What kind of comic book's character was best suited to small sheep farmers, what was their preferred color, and what were the combined effects of such characters and color on the farmers' knowledge about small sheep farm management? These questions directed researchers to design a 2x2 factorial quasi experimental study. Four farmer groups were involved in the study. The results indicated that the comic book characters' effect on the farmers' knowledge gains was highly significant; the comic book's color effect on the farmers' knowledge gains was also significant, and the combined effect of the comic book's character and colors was not significant. Further tests demonstrated that the farmer group exposed to the colored comic book with human character performed much better than the other three groups in the posttests. So, the conclusion was that farmers preferred the colored comic book with human character to learn the small sheep farm management.

Key words: comic book, story character, color, sheep management, farmer's knowledge

INTRODUCTION

In agricultural extension conduct, agents often times had to rely on printed materials to promote independent reading and learning among farmers. It was widely accepted that printed materials had several advantages. First, printed extension messages were permanent and durable for long time. They lasted until the media were destroyed. Second, the messages were standardized so as to create the same meaning among readers. Third, farmers could easily store, retrieve, and reread the media as much as they needed, in leisure time. Fourth, the media could be conveniently shared to other persons.

To encourage independent learning among farmers, adult educators suggested the

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use of picture books. Osborn (2001) said that there were four types of picture books that extension educators may consider:

1. wordless books: the story was told completely through pictures. No text was included.
2. picture books with minimal text: there was a small amount of text, but the illustrations revealed most of story.
3. picture storybooks: pictures and text had about the same presence and interacted to tell the story.
4. books with illustrations: there were more words than illustrations, but the illustrations gave enlightenment and clarification to the story or informational text.

Of the four picture books listed above, the third – picture story books, where picture and text interacted to tell the story – were developed for this research. They were popularly known as comic books. They were non-periodic media. They were not published on a regular basis such as daily newspapers, weekly magazines or monthly journals. Despite these characteristics, comic books, like any other print media, had the ability to disseminate information to a wider audience. To this date, comic books were still very popular media. Many people red comic books to get entertainment and gratification (Lyga, 2006; Wittich and Schuller, 1973:126).

This popularity encouraged some educators to experiment with this medium in instruction. According to Parlato (1980), Comenius was the first scholar that introduced the use of comic book in education. Further, Thorndike (Sudjana & Rivai, 1990) investigated the use of comic books in disseminating home electricity information to primary school students. He found out that students who red one comic book a month gained words twice than what they could get from reading other books regularly in a year. On the other hand, Dail (1995) mentioned that comic books could develop children emotion and reading interests.

In line with the above findings, Wilkinson (1985) said that comic books had a strong effect on children knowledge gain and recall about human immunization against pathogenic bacteria. Then, said Wilkinson (1985), the use of comic books in instruction increased students' reading interests and speed, and abilities to present what they had red.

Furthermore what made the comic books popular and easy to follow was their appearances and contents. Their simple and colorful appearances attracted and motivated many people to read them. In this way comic books easily caught their readers' attention. According to Bradshaw & Crutcher (2006), motivation together with attention improved learning considerably. Besides, the contents of the comic books were full of pictures and less words that made them easy to comprehend. No wonder if both younger and older audiences liked to read comic books (Lionberger, 1982).

With their simple and colorful appearances, comic books were attractive to many potential audiences. Most of them were familiar with the comic books' characters and were curious about what was going to happen to the characters in the story. Basically, the comic books contents were pictures and texts. The pictures were usually filled line drawings, conveying the characters and simple surroundings around them; whereas the texts were generally verbal messages written in balloon dialogues - originating from the characters involved in conversation situations.

To promote understanding, these messages were written in a simple and direct way. Active and strong words were used in dialogues and followed by action (Wittich & Schuller, 1973). At certain point, additional text were added at the lower or upper part of some particular frames to explain certain situation, when no dialogue was necessary (Bryan *et al*., 2002).

The above comic books' characteristics inspired development workers, including extension workers to use the medium to disseminate various development messages to rural audiences with limited literacy abilities (Trent & Kinlow, 1978; Nehiley, *et al*., 1982;

Brian, *et al*., 2002; Juniewicz, nd). These messages ranged from daily living problems such as sanitation and clean water consumption, family planning and health, food and nutrition to agriculture, social, economic and political issues such as growing certain crops or raising new animal breed, household financial management, racial discrimination and general elections.

In this study, comic books were especially designed to help farmers learn how to manage their small sheep farms. By exposing the farmers to these media, they were expected to gain certain knowledge and skills to improve their sheep raising business. In this relation, there were two story characters developed to convey the extension messages to the farmers, i.e., human versus animal (sheep). The human character was particularly selected for a common reason. For instance, in an extension-communication situation, an Extension agent - representing human figure that usually communicated with the farmers. However, in in a fable situation, all characters involved were animals. They communicated to each other just like human did.

Since raising sheep was important to many small farmers in west Java, especially in the village of Kulur, Majalengka, this study tested whether human or animal character was effective for conveying messages about the small sheep farm management to the sheep farmers.

In relation to this, three research hypotheses were tested in the study.

1. The small farmers that were exposed to the comic books with human characters, gained higher knowledge scores on the management of small sheep farm, than those exposed to the comic books with animal characters.
2. The small farmers that were exposed to the colored comic books, gained higher knowledge scores on the management of small sheep farm, than those exposed to the black and white comic books.
3. The small farmers that were exposed to the colored comic books with human character gained the highest knowledge score on the management of small sheep farm, than those exposed to the black and white comic books with human characters as well as those exposed to the comic books with colored or black and white animal characters.

MATERIAL AND METHODS

The Experimental Units

Four groups of small sheep farmers from the Kulur village, district of Majalengka, West Java, were recruited for this study. Each of the four farmer groups had 15 members. They lived in close neighborhoods. Of the 60 farmers involved in study, half of them aged between 20 to 35 years, and the rest aged between 36 to more than 50 years.

Around seven tenths of them were males and the rest were females. About four fifths of them had primary school and the rest had junior high or senior high school education. The majority of them claimed that they had more than one contact with extension agents in the last three months prior to the research conduct. Finally, most of them listen to radio, but mostly for entertainment.

The Comic Books

Four types of comic books were produced to fulfill the requirement of a 2x2 factorial study. There were two main factors of the comic books observed in this study. The first was the comic books' story characters. This factor had two levels i.e., the human character and the animal character. The second was the comic books' color that also had two levels, i.e., the black and white and the colored picture.

The content of the comic books were basically about the management of small sheep farms. The content outline was as follows:

1. the sheep feeds and feeding.
   a. The nutrition needs
   b. The feed resources
2. feeding the sheep.

   a. The daily feed allowance for sheep with various growth status
   b. the frequency of sheep feeding
3. the sheep reproduction.
   a. The heat period of ewes
   b. The first mating of virgin ewe
   c. The mating management
   d. The right time to mate ewes during their heat period
   e. Inbreeding and the lamb weaknesses
   f. The pregnancy
4. the common sheep diseases and cures.
   a. Bloat
   b. Internal and External parasites
   c. Mastitis
   d. Mouth and Feet disease
   e. Orf
   f. Diarrhea
   g. Red Eye
5. the pregnant and the nursing ewes care.
   a. The pregnant and the nursing ewe housing
   b. The pregnant ewe care
   c. The laboring ewe care

After the message contents were checked with three sheep farm management experts, a story board was developed for each comic book (Kemp, 1975). An artist was then asked to draw picture sketches and balloon dialogues and necessary texts for each comic book draft. After being evaluated, these sketches and texts were modified to make the final comic book picture and texts page by page.

The first draft of the comic books were pretested with 20 sheep farmers at the same research sites. Picture and text modifications were done in line with the pretest findings. The four versions of the comic book were then produced for research implementation.

The Research Design

Since researchers had to work with four naturally assembled farmer groups, the closest design followed in this study was one of the quasi experimental designs, i.e., the non-equivalent control group design (Campbell & Stanley, 1966). According to Campbell & Stanley (1966), this design was one of the most widespread experimental design used in educational research involved an experimental group and a control group both given a pretest and a posttest, but in which the control and the experimental groups did not have pre-experimental sampling equivalence. However, Campbell & Stanley (1966) further mentioned that the more similar the experimental and the control groups were in their recruitment and the more this similarity was confirmed by the scores on the pretest, the more effective this control became.

Further elaboration of the above research design indicated that this design was actually also a 2x2 factorial design, involving four farmer groups as experimental and control groups. They were all given pretests and posttests. Additionally, this study assessed also the main effects of factor A and factor B on posttests, and the interaction effect of factor A and B on posttests.

As mentioned above, the first main factor of this study was the comic books story character. This factor had two levels, i.e., the human and the animal character. Then, the second factor was the comic books' picture color, that had also two levels, i.e., the black and white and the colored pictures of the comic books. The configuration of the two main factors of the comic books, and the interaction among them was presented in a matrix in the following Table 1.

Data and Instrumentation

Data. Three types of data were collected in this study. The first was the participants' characteristics, such as, their domiciles, ages, gender, education, contacts with extension agents, and media exposure. These data were collected and analyzed, mainly for assessing the similarities of the four groups The second type of data collected to further determine the four groups similarity was the pretest data. Lastly, the posttest data were collected primarily for testing the three main research hypotheses.

Instrumentation. Three instruments were developed to collect the above data. The first instrument was a questionnaire constructed to gather the above participants' characteristics. The second instrument was a pretest instrument that was used to measure the participants' knowledge about management of small sheep farm prior to their exposures to the comic books, and the third instrument was a posttest instrument that was used to measure the participants' knowledge on management of small sheep farm after their exposures to the comic books.

Each of the pretest and posttest instruments contained 25 true or false items about management of sheep farm. Therefore, the maximum posttest score that a farmer participant might earn was 25 and the minimum posttest score was zero.

To obtain the content validity of the test instruments, the above list of knowledge areas of a small sheep farm management was checked by three sheep farm management professionals. A particular item on the list was retained, when the majority or all of the experts agreed to it.

The reliability of the test instruments was determined through a field test with 20 sheep farmers at the same research site. The Kuder-Richardson procedure (Guilford, 1978) was used to calculate the reliability coefficient. The calculated r_{tt} was 0.78 that pointed out the quality of the instrument. It was good enough to collect the required data from the small farmer participants for testing the research hypotheses.

Table 1. The comic book's story characters and color matrix on the study of farmer management knowledge gain on sheep farming in Kulur, Majalengka, West Java, 1994

Story character	Picture color	
	Colored	Black and white
Human	Colored human character	Black and white human character
Animal	Colored animal character	Black and white animal character

The Experiment Conduct

Four small sheep farmer groups with 15 members each were involved in this study. The experiment was conducted in a primary school building during semester break. Four similar class rooms were used for this study. Each group was randomly placed in a class room. Every person was seated on his/her own chair, and could comfortably read and write with a provided ball-pen on the test instruments on an individual desk.

The situation around the school was quiet and there was no noise that could distract the participants' attention from the tests and the treatments administered to them. The experiment was conducted during the day time at 14:00 o' clock. The shadow of the trees around the school building and the breeze made the participants felt comfortable in the class rooms.

In every class, ten minutes prior to the pretest was used by an extension agent -- that was trained earlier -- to explain several aspects of the study and to provide instructions and examples of how to complete the pretest. The next twenty minutes were given to the research participants to complete the pretest. Then, after the pretest, the four versions of the comic books were randomly distributed to the four farmer groups. Participants in a particular treatment group received their individual copies of the same comic book version received by the group. They were asked to read their individual copies of comic book for 30 minutes. When the exposure time was over, the participants were asked to close their books, and then were given posttests for twenty minutes.

Data Analysis

Several statistical procedures were used to analyze the obtained participants' characteristics, pretest and posttest data. The

frequency distribution was used to analyze the respondents' characteristic data. Next, the one-way analysis of variance was used to determine the similarity of the four sheep farmer groups at pretest. Then, the two-way analysis of variance was used to determine the main effects and the interaction effect of the comic books' story characters and color on the sheep farmer knowledge gains on the management of small sheep farm. Lastly, the duncan multiple range test (Steel & Torrie, 1981) was used to determine whether the four combined effects made the difference on the sheep farmers' knowledge gains on the management of small sheep farm.

RESULTS AND DISCUSSION

The Respondents' Initial Knowledge

The respondents' initial knowledge about the management of small sheep farm was measured prior to the treatment administration to the four farmer groups involved in the study. The four groups were given pretests on the management of small sheep farm. The pretest results were shown in Table 2.

Table 2 pointed out that the average pretest scores of the four respondent groups was 66.87. This score was much lower than the highest score that they could possibly have reached, i.e., 100.00.

Table 2 demonstrated that the averages of the four pretest score were not significantly different. So, this finding indicated that the four sheep farmer groups were about equal at the pretest. Additional observations on their characteristics, included domiciles, ages, gender, education, contacts with extension agents, and media exposure indicated that the four farmer groups were also similar. So, the researchers may rest assure that the groups' characteristics and their pretests would not affect their performances in the posttest.

Table 2. The average respondents' pretest scores on management of small sheep farm in Kulur, Majalengka, West Java, 1994

	Human character	Animal character	Average
Colored	66.13	67.47	66.80
Black and white	66.67	67.20	66.93
Average	66.40	67.33	66.87

The Effect of Comic Books' on the Farmers' Knowledge Gains

Table 3 presented the four treatment groups knowledge gain scores. Table 3 showed that farmers exposed to the comic books with human character gained higher knowledge scores than those exposed to the comic books with animal character. Similar findings also occurred with farmers exposed to the comic books with colored and black and white pictures. Accordingly, farmers exposed to the colored comic books gained higher knowledge scores than those exposed to the black and white comic books.

The small farmers that were exposed to the comic books with human characters, gained higher knowledge scores on the management of small sheep farm, than those exposed to the comic books with animal characters. The justification and the logical argumentations for explaining the above research findings were as followed. As a matter of fact, the research findings demonstrated that the four experimental groups responded almost similarly in the pretests and differently in the posttests, after being exposed to each particular comic book versions. These evidences demonstrated that the comic books did make differences among the four experimental groups on the posttests.

Furthermore, two of the four experimental groups, after being exposed to the two versions of the comic book with human character, whether colored or black and white, gained higher knowledge scores in the management of small sheep farm than those exposed to the other two versions of the comic book, whether

Table 3. The respondents knowledge gain scores by their treatment groups on management sheep farming in Kulur, Majalengka, West Java, 1994

Story character	Picture color		Average
	Colored	Black and white	
Human	14.93*	7.73	11.33
Animal	10.13	6.67	8.40
Average	12.53	7.20	9.87

Note: * significantly different at alpha = 0.05.

colored or black and white, with animal character.

The small farmers that were exposed to the colored comic books, gained higher knowledge scores on the management of small sheep farm, than those exposed to the black and white comic books. Additionally, two of the four experimental groups, after being exposed to the two colored comic book versions, whether with human or animal character, gained higher knowledge scores in the management of small sheep farm, than those exposed to the other two black and white comic book versions, whether with human or animal character.

The small farmers that were exposed to the colored comic books with human character gained the highest knowledge scores in the management of small sheep farm, than those exposed to the black and white comic book with human character as well as those exposed to the colored and the black and white comic books with animal characters – was also confirmed.

Finally, The question -- how the story character and the picture color of the comic books, whether singly or together made differences on the posttest – had to be answered. It was clear that the facts pointed out that the comic books' story characters contributed significantly to the above two experimental groups' achievements. Moreover, the effect of human character on the farmer groups' performances in the posttests was outstanding, when compared to the effect of animal character on the farmer groups' achievements. This finding was supported by a follow-up study accomplished later with two different farmer groups in Majalengka (Jahi, 2001).

This was mostly because the farmers, as adult persons with their rural backgrounds felt much easier to accept the comic books' human character than the animal character as messenger of extension messages, especially in reading and recalling the contents of the comic books' stories to solve problems that they confronted in the posttests. Additionally, such illustrations reemphasized the information regarding the subjects conveyed in the comic books, and therefore, increased the farmers' comprehension on the subjects (Nehiley, *et al*., 1982).

As of the effects of the comic books' picture color on the experimental groups' achievements in the posttests were explained as followed. Color was well known for its' ability to increase the readers' attraction and attention to the subjects conveyed in the comic books than black and white. Furthermore, improved attraction meant improved attention, and improved attention meant improved retention. In turn, improved retention certainly meant improved understanding, comprehension and recall of the subjects in the posttests. So, obviously those exposed to the colored comic books reacted differently than those exposed to the black and white comic books in the posttests.

Those received the colored comic books felt that the books were more attractive and pleasing, that subsequently built their attentions and foci on the story characters and to what they said or explained in the story. This in turn affected their foci on the specific subjects of the books. In this way, the farmers improved their memories and developed their understandings and comprehension of the subjects conveyed in the comic books, better than those exposed to the black and white comic books.

Moreover the colored picture of the human character, together with the story line promoted the participants' better attention, foci, retention, understanding, and comprehension,

and therefore, raised the participants' memory of the subject conveyed in the comic books. During the posttests, these subjects were easier recalled and applied in the problem solving processes. Besides, the data obtained pointed out that this experimental group performed best in the posttest concerning the small sheep farm management. Over all, the four experimental groups performed better in the posttests than in the pre tests. So, the comic books provided them with easy reading materials that were effective for communicating learning subjects, such as the small sheep farm management.

These research findings were in line with the Lionberger & Gwin's (1982), the Wilkinson's (1985), the Parlato's (1980), the Trent and Kinlaw's (1978) and the Nehiley, *et al's* (1982) findings. Comic books, not only could improve the readers' knowledge on certain learning subjects, but could also expedite their deeper understandings and comprehensions on the subjects, and therefore, could improve their literacy as well.

CONCLUSIONS

The comic books with human story character were more appropriate for improving the small farmer knowledge about the management of small sheep farm than the comic books with animal story character. The colored comic books were more suitable for enhancing the small farmer knowledge about the management of small sheep farm than the black and white comic books. The colored comic book with human story character was the most proper reading material for upgrading the small farmer knowledge about the management of small sheep farm in the village of Kulur, District of Majalengka, West Java, Indonesia.

REFERENCES

Bradshaw, G. & R. J. Crutcher, 2006. Beyond the printed page: Style suggestions for electronic texts. Journal of Online Learning and Teaching. 2. Htpp://jolt.merlot.org/document/Vol2_No4_bradshaw.pdf [29 Juli 2009]

Bryan. G., G. W. Chilcoat, & T. G. Morrison. 2002. PZap! Wham! Creating comic books from picture books in social studies classrooms. Canadian Social Studies. 37: 1–13. http://www.quasar.ualberta.ca/css/Css_37_1/FTcomics_in_social_studies.htm. [26 Maret 2009]

Campbell, D. T. & J. C. Stanley. 1966. Experimental and Quasi-Experimental Designs for Research. Rand McNally College Publishing Company, Chicago.

Dail, E. 1955. Audio Visual. The Dryden Press, New York.

Guilford. 1978. Fundamental Statistics in Psychology and Education. McGraw-Hill Kogakusha, Ltd., Tokyo.

Jahi, A. 2001. Pengaruh pendedahan buku bergambar tentang cara memelihara domba pada peningkatan pengetahuan peternak domba Garut di desa Ciomas dan Kawung Girang, Kabupaten Majalengka, Jawa Barat. Med. Pet. 24 (Edisi Khusus): 33-38.

Juniewicz, J. Comic books and the addressing of social issues. http://www.jasonjuniewicz.com/Writing/comicpaper.pdf. [26 Maret 2009].

Kemp, J. E. 1975. Planning and Producing Audiovisual Materials. Thomas Y. Crowell Company, Inc., New York.

Lionberger, H. F. & P. H. Gwin. 1982. Communication Strategies: A Guide for Agricultural Change Agents. The Interstate Printers & Publishers Inc., Danville.

Nehiley, J. M., J. Stephens, & J. Sutherland. 1982. Cartoons: When are they effective? Journal of Extension. 82-2a-3.pdf. http://www.joe.org/joe/1982march/82-2-a3.pdf. [26 Maret 2009]

Osborn, S. 2001. Picture books for young readers. ALAN 3. Htpp://www.scholar.lib.vt.edu/ejournals ALAN v28n3/osborn.html [5 Agustus 2009].

Parlato, R., M. B. Parlato, & B. J. Cain. 1980. Fotonovelas and Comic Books: The Use of Popular Graphic Media in Development. USAID., Washington, DC.

Steel, R. G. D. & J. H. Torrie. 1980. Prinsip dan Prosedur Statistika: Suatu Pendekatan Biometrik. Translated by Bambang Sumantri. PT Gramedia, Jakarta.

Sudjana, N. & A. Rivai. 1990. Media Pengajaran. Sinar Baru, Bandung.

Trent, C. & R. Kinlaw. 1979. Comic books: an effective teaching tool. Journal of Extension. 17: 18–23. http://www.joe.

org/joe/1979january/79-1-a3.pdf. [26 Maret 2009]

Wilkinson, J. A. 1985. Guide to Basic Print Production, Designing and Production of Art Work. Clare Son & Co., Ltd., London.

Wittich, W.A. & C.F. Schuller. 1973. Instructional Technology: Its Nature and Use. 5th Ed. Harper and Row Publisher, New York.